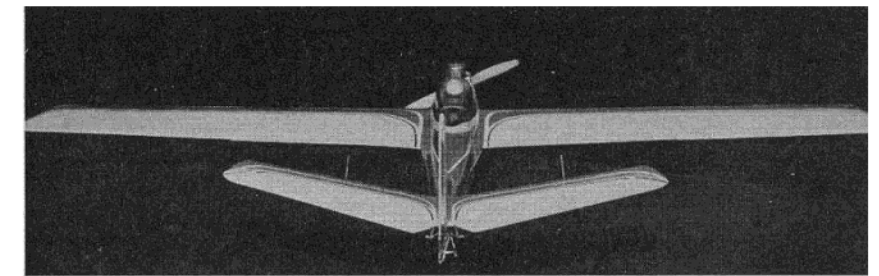


# SWEEK

RCM presents the second in a continuing series of challenging new designs for Class III competition or sport.



BY REX TAYLOR

PHOTOS BY WHITEY PRITCHARD

ONCE upon a time there lived a designer of radio controlled aircraft who dreamed of designing the perfect airplane. Oh, it would be a thing of beauty. It would fly perfectly through all maneuvers and always bring its builder great glory in the contests.

Well, maybe it works that way in the fairy tales, but for me it has taken a period of seven years and four airplanes to come up with the airplane which each of its ancestors was designed to be. Like a lot of other modelers, I had grown a little weary of the sameness of all of the multi-stunt designs, low wing, stab on or about the thrust line, almost identical force arrangements on them all, and so forth.

When looking over the ships at any local flying site they are all the same, basically, except maybe the rudder or wing tips are shaped a little differently. Sure, they do fly excellently, but why not try to improve even this and, at the same time, design a ship that has a different look, one that will stand out on the flight line because it is different? This is what I had set out to do, and, while none of the first three designs I produced was a bad airplane, none seemed to be exactly what I wanted.

It seemed to me that a good multi ship would have to have these features:

**A.** A steady pitch axis to keep it from hunting up or down.

**B.** It should roll about the thrust line, keeping the fuselage as a pivot, and not show any tendency to barrel roll. It should not change its headings or lose airspeed excessively during consecutive rolls.

**C.** It should enter spins easily and recover instantly with no overspin or excessive corrections.

**D.** It should be fast, smooth and have a relatively light wing loading.

**E.** It should look good as well as fly.

Normally, at this point, the designer goes into a long dissertation relating to aerodynamic theory and gives complicated and wondrous reasons why his particular design is aerodynamically perfect for the job intended. I spent a period of seven years fiddling with this force arrangement off and on, with numerous kits and magazine plan ships in between, but always seemed to come back to my first love.

My first airplane was an 800-square-inch shoulder wing design, .45-powered on an 8-channel reed rig. It flew well but rolled much too slowly, and had too much trim change between high and low throttle.

The second ship was the first taper wing job, with a fast, smooth roll, but

unfortunately, it didn't last long because of the P. I. O. factor (pilot-induced oscillations). A bad case of more-airplane-than-I-had-experience-to-fly!

The third job was very close to the dream but still just wasn't quite right. It went through all the maneuvers well except spins. It had to be flown out, or it would take an extra 100 feet coming out. This resulted in a major rebuild job twice. This airplane was the only one to use strip ailerons and seemed to have more yaw in the rolls than the versions with conventional ailerons.

Since I had just acquired a new Kraft KP6-S which has a very small airborne package, I could finally put the wing where I felt it should be — in the center — because the receiver and servos required only a depth of one and three-quarters inches below the wing.

I had been building strong for two weeks when one of my flying-type buddies came by to visit. Upon seeing this newest bird he asked, "What the hell is that?" I replied, "It's a sort of swept back kind of freak."

So Sweek is a shortened version of this description although it does sound like some sort of disease. Maybe it is a disease, but probably one any modeler who builds it will be glad he got.

Before drawing the Sweek, all the

good and bad habits of the first three ships had been analyzed. The poor spin recovery I felt was the result of the stab riding in wing turbulence and becoming less effective. The dihedral in the Sweek stab is not just for looks, it cures this problem. Many modelers have been curious about this stab treatment and the only peculiarity I have found is that it takes more down elevator travel than up to bring about equal maneuvers. This is accomplished by raking the horns back 15°.

Sweek will enter a true spin easily on command, the spin has fast rotation and recovery is automatic when controls are neutralized. The ailerons were made conventional and big, while throw has been held down, which results in a fast, smooth roll and almost no loss of air-speed. Sweek will roll from the limit of radio range in one direction to the opposite extreme and maintain altitude and heading all the way.

The ship has very good slow flight characteristics and aileron control is positive at all speeds. This is accomplished by using a 16% section at wing root and progressively tapering to a 20% section at the tip, causing the wing to stall from center out to the tips and holding aileron control to the bitter end.

Sweek uses a full symmetrical zip-zip

airfoil for the simple reason that it flies very well, and it seems logical to me that an aircraft which is to fly equally well upright or inverted should be as near symmetrical in all respects as possible.

The ship is flown on a .60. While it is light enough to be flown with a good .35, it is my opinion that the more power the better. With speed and power to spare you have an adequate safety factor. I have seen many underpowered airplanes stagger around in a poor imitation of flight, or stall on takeoff, or not have the power to pull through maneuvers; but I've never seen a plane lost from too much power. You can always throttle back, you know, but when the little engines are extended full out, that's all; and, Brother, if it ain't enough — look out!

Sweek is the easiest ship to fly I have ever flown. It goes exactly where you aim it, and just does not have any bad habits. The original ship flew right off the drawing board and has never had any trim changes. The first flight was actually a letdown as I was prepared for trouble and nothing exciting happened. Each flight is pure enjoyment from takeoff to touchdown.

Sweek is not yet the ultimate airplane — probably no airplane ever will be —

but it is a far better-performing airplane than any I have built in the last eight years of very active building and flying of multis.

So if you want something different, if you want to break the low-wing habit, if you get your kicks out of flying an airplane that really performs, then get out the old glue pot and a bundle of balsa and let's build a flying machine!

## CONSTRUCTION

Since Sweek was designed around the new Kraft gear, which is pretty small, you'd better make sure your gear will go in it. Lay the gear on the plans, and if there is not enough room, you'd better fatten it up in the belly to the alternate outline.

Once you have arranged your gear on the plans and determined that it will fit (and don't forget to leave room for wiring harnesses), construction is started by cutting fuselage sides and plywood doublers, and joining same with contact cement. Fuselage sides are cut out with a hole for wing to slide through only. Wing is installed in fuselage and everything faired in before the cutout for wing through fuselage top is made. This method saves quite a lot of time in shaping and sanding. Fuselage formers and

motor mounts are installed next. Begin by installing F2 and F3, then before installing F1, drill it for nose gear mount. A Top-Flite nylon nose-gear mount was used in the original. Fuselage is now stock on the original, and templates and bending instructions are provided on the plans. This is a small airplane and in order to pack a maximum fuel load (9½ oz.) all available space must be utilized, which dictates a custom tank. Don't let this scare you, though, they are easy to build. Why, way back in ignition days we built all our tanks . . . etc., etc. Seriously, though, it does give maximum capacity and adds a lot to the strength of the nose as it becomes a strength-bearing member. Access to the inside of the tank can be made from the rear if it should ever need clank replaced. I have found these metal tanks always outlast my airplanes. Plans also show clunk tank out-across the wing cutout section and should not be omitted.

#### Wing and Stab

The wing and stab are pretty standard, so I will not go into any great detail. Do not fail to use spruce spars and lots of white glue on the internal wing structure, particularly gear mounts, aileron crank mounts, and dihedral braces.

The stab is like all sheet covered stabs except that it has dihedral. Be sure to select reasonably light balsa for stab and elevators to avoid a tail-heavy condition.

After all sub-assembly work is complete, join the stab to the fuselage and fillet with plastic balsa. Next slide the wing through the fuselage and glue to joined at extreme rear and rest of formers added.

#### Tank

The fuel tank is constructed of tin can



line for those who prefer the easy way out.

After tank, nose gear and steering rod, throttle tube and blind nuts for motor mounting bolts are installed, fuselage is ready for bottom planking and top block. Next add fillet block cut out for wing clearance and rough carve shape of nose and fillet, but don't finish any contours yet.

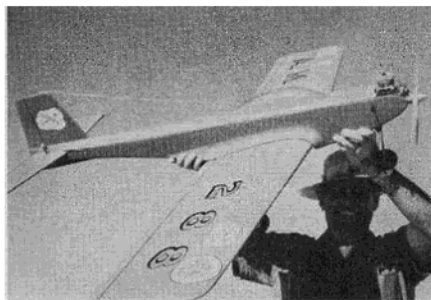
Sweek's fuselage, when shaped out, loses all its slab side appearance and looks very rounded. The fillets and

cheek bulges look far more attractive than a square box and are worth the extra effort involved. The wing fillet fairing block serves to increase strength the top section only. Now finish contouring the fuselage and the fillet area around wing root. This will give you an airplane that looks as if it were almost one piece when it is finished, and assures excellent fits on all mating parts.

Now carefully cut fuselage top to release wing, and you are ready to start sanding and finishing flight surfaces. Take your time here and resist that urge to hurry so you can fly it.

The original uses bicycle spokes to retain the wing and no provision is made for knock-apart on rough landings. Use your own judgment here. Wing can be rubber-banded or nylon screws as you like. It seems when you hit hard, it lon, MonoKote, or whatever you prefer. The original has the fuselage covered completely with lightweight glass cloth and polyester resin. Some will tell you this results in a heavy airplane. 'Tain't so. Sweek weighs 5¼ pounds with empty tank, and that's light.

Now that we have this bird built and covered, how about that paint job? Why settle for less than one that will really draw attention? Let's face it, we're all a bunch of hams and we love to have the spectators admiring our plane, don't we? So don't stop now, Tiger, put on



Sunfli III, Joe Bridi's original pattern ship. VECO 61 and Logictrol give life to excellent design featuring progressive airfoil, sub-rudder.

gedly tested on the bench and in the air before being released by the young designers. About a dozen are currently in use as prototypes with one set having migrated to San Antonio, Tex. along with Lt. Col. Rex O'Conner. (He's not an L/C yet, actually — this is our way of 'averaging' our error in the March issue where we tagged the good-natured Air Force major with captain's tracks. . . .) Rex and his MARC 6, along with several others, were on hand for the Buckeye workout with one being used by Chuck Watkins in his Goodyear racer that placed 3rd in the tough 27 plane competition. Performance readily matched that of the many 'standards'

that wild paint job, use all those bright colors! The few extra hours you put in will be well worth it on the first trip to the field.

Install your gear as per manufacturer's instructions, remembering that a little extra time spent here may extend the life of your plane considerably.

Before flying, check carefully for warps, binds in control surfaces, and check your engine out at all speed ranges for electrical noise, vibration, malfunction, etc. If all checks well, fill 'er up and push the GO lever!

Sweek is fast, sweet and gentle, and you will soon fall in love with this little bird.

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